Small Business Innovation Research/Small Business Tech Transfer

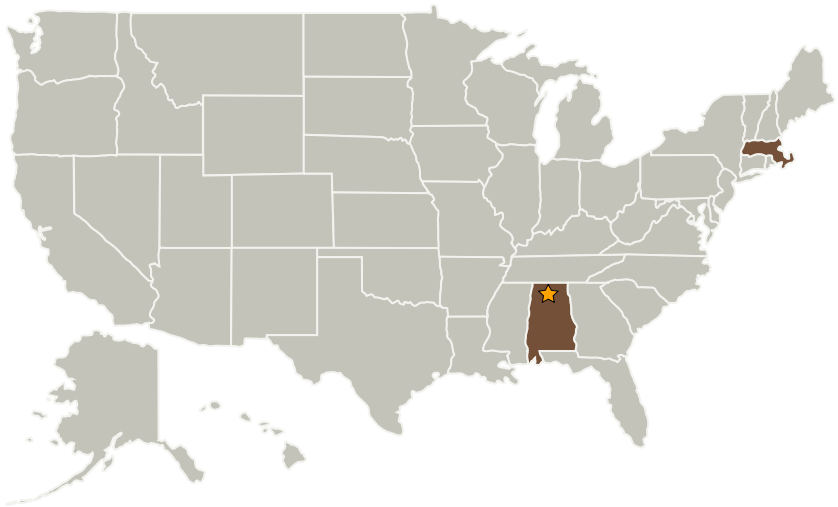
Aeorgel Insulation for Integrated Cryotanks and TPS, Phase II

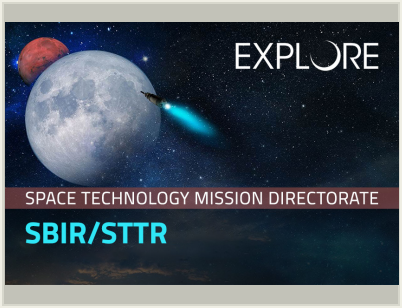
Completed Technology Project (2004 - 2006)

Project Introduction

NASA seeks new and innovative technologies for materials, processes, and manufacturing that will provide safe, reliable, lightweight, and less expensive launch vehicle and spacecraft components. The proposed project SBIR Phase II project will develop aerogel insulation materials for composite cryotanks and TPS. Introduction of aerogel materials to reusable launch vehicles will result in significant reductions in the weight and volume of cryogenic insulation and high temperature Thermal Protection Systems. Aspen Aerogels' materials typically demonstrate 2-4x improvement in thermal conductivity over traditional insulation materials. When specifically engineered to work with current integrated insulation systems, a marked reduction in thickness and overall weight will be realized. Therefore, with team partner Northrop Grumman Corporation, Aspen Aerogels proposes to develop durable and lightweight aerogel insulation for current spacecraft such as the shuttle and future reusable launch vehicles. During the proposed effort we will develop and characterize fiber reinforced aerogel composites for use as cryogenic and high temperature insulation for reusable launce vehicles. We will also optimize the organic modified silica aerogels developed during the Phase I effort as an approach for improving their strength at cryogenic temperatures. A low-cost, environmentally benign manufacturing process will be used.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

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Organizations Performing Work	Role	Type	Location
★Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Aspen Aerogels, Inc.	Supporting Organization	Industry	Northborough, Massachusetts

Primary U.S. Work Locations	
Alabama	Massachusetts

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.2 Thermal Control Components and Systems
    - TX14.2.4 Insulation and Interfaces